Topic: Ecosystem processes

Long-term effects of riparian-plant diversity loss on a stream invertebrate shredder

Isabel Fernandes*, Sofia Duarte, Cláudia Pascoal, Fernanda Cássio
Centre of Molecular and Environmental Biology (CBMA), Department of Biology, University of Minho, Braga, Portugal
*isabelrodriguesfernandes@bio.uminho.pt

We used a pool of 3 common riparian-plant species in Portugal (alder, oak and eucalyptus) to examine the potential long-term impacts of riparian diversity loss on the feeding behaviour and body composition of a stream invertebrate shredder (Limnephilidae). Fine-mesh bags containing mixtures of the 3 leaf species were immersed in a mixed-forested stream to allow microbial colonization. After 2 weeks, colonized leaves were transferred to microcosms containing stream water and all combinations of 1 to 3 non-colonized leaf species enclosed in mesh containers. The experiment ran for 6 months. In each month, a portion of leaf material was used to inoculate new microcosms containing non-colonized leaf material, keeping the leaf species composition constant. After 2 and 6 months, those leaves were used to feed invertebrate shredders for a period of 8 days. Leaf consumption and FPOM production by the shredder were affected by leaf species diversity, with higher values in mixtures with 3 leaf species. Leaf mass loss and FPOM production were also affected by leaf species identity, but not by time of leaf diversity loss. C:N ratio of FPOM was affected by leaf identity and showed a positive linear relationship with initial leaf C:N ratio. Invertebrate C:N ratio increased along time of leaf diversity loss. Results suggest that the riparian-plant diversity loss can affect leaf consumption, FPOM production and invertebrate body composition, but effects did not appear to change at longer times.

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